

Abstract of the Disclosure

LIGHT WEIGHT RUBBER COMPOSITION CONTAINING CLAY

This invention relates to a light weight rubber blend that can be beneficially used in rubber articles, such as power transmission belts and tires. In the rubber blends of this invention a 2:1 layered silicate clay, preferably an organophilic 2:1 layered silicate clay, is substituted for a portion of the carbon black that is normally used in the rubber as a filler. This can be done without sacrificing the physical properties of the rubber composition in cases where the rubber in the blend contains an amino group. Tire tread compounds that utilize such rubber compositions offer increased vehicle fuel economy.

This invention also relates to improving the strength, modulus and elongation of carbon black and silica filled compounds by the addition of 2:1 layered silicate clays thereto without modifying the level of carbon black or silica. Such compounds have increased flexibility and tensile strength for tire side-wall applications. This invention more specifically discloses a process for making a vulcanized rubber article comprising the steps of (1) kneading (a) an amino group containing rubbery polymer, wherein said amino group containing rubbery polymer contains from about 0.1 weight percent to about 20 weight percent of a monomer containing an amino group, and (b) from 0.1 to about 25 phr of a 2:1 layered silicate clay which is an organophilic 2:1 layered silicate clay; and (c) conventional rubber compounding ingredients selected at least from the group of curing agents, cure accelerators, cure activators, processing aids, reinforcing fillers, oils, cure retarders, resins, and antidegradants at a temperature within the range of about 70°C to about 190°C in a bulk thermomechanical mixer to produce a mixed compound; (2) discharging the said mixed compound from the bulk thermomechanical mixer; (3) forming the mixed compound into an article; and (4) vulcanizing the article.

The present invention also reveals a rubber composition that is comprised of: (1) an amino group containing rubbery polymer, wherein said amino group containing rubbery polymer contains from about 0.1 weight percent to about 20 weight percent of a monomer containing an amino group, and (2) from about 0.1 phr to about 25 phr of a 2:1 layered silicate clay. The present invention further discloses a tire which is comprised of a generally toroidal-shaped carcass with an outer circumferential tread, two spaced beads, at least one ply extending from bead to bead and sidewalls extending radially from and connecting said tread to said beads; wherein said tread is adapted to be ground-contacting; wherein the tread is comprised of the rubbery polymer of this invention.